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ABSTRACT

The effects of contingency training, instructor expressiveness, and student incentives on student achievement and attributions were investigated in a simulated college classroom. The following conditions were involved: a contingency manipulation resembling an aptitude test; an instructor lecture; two levels of student incentive; and an achievement test based on the lecture material. A total of 296 University of Manitoba students participated. Following an incentive manipulation, students wrote an aptitude test providing contingent, noncontingent, or no feedback, and responded to an attribution questionnaire. All students then observed a low or high expressive instructor, and completed an achievement test and an attribution questionnaire. After the contingency manipulation, noncontingent students reported less perceived control and made less internal attributions to their performance on an aptitude test. Post-lecture results indicated that the highly expressive instructor increased achievement and self-confidence in contingent compared to noncontingent students in low incentive conditions. The findings suggest that exposure to noncontingent outcomes can impair some aspects of a student's academic development. (Author/SW)

Perceived Control in the Classroom: Student Contingency Training and Instructor Expressiveness[1]

by

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Running Head: Perceived Control

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ABSTRACT

The effects of response/outcome contingency training (contingent, noncontingent, no feedback, no training), instructor expressiveness (low, high) and incentive (low, high), were investigated in a simulated college classroom. Following an incentive manipulation students wrote an aptitude test providing contingent, noncontingent, or no feedback, and responded to an attribution questionnaire. All students then observed a low or high expressive instructor, and completed an achievement test and an attribution questionnaire. After the contingency manipulation noncontingent students reported less perceived control and also manifested a helplessness attribution profile. Post-lecture results indicated that the high expressive instructor increased achievement and self-confidence in contingent compared to noncontingent students in low incentive conditions.

Perceived Control in the Classroom: Student Contingency Training and Instructor Expressiveness[1]

Perceived Control in the Classroom

Within the last decade increased attention has been directed toward the concept of control in the educational system. One approach has focused on the relationship between a person's belief in his/her control over environmental events and its effects on educational outcomes. For example, Weiner (1979) links the concept of control to causal attribution processes. He postulates that students explain their academic successes and failures by making causal attributions to factors which are controllable (e.g., effort) or uncontrollable (e.g., luck). These, in turn, cause expectations which can affect student self-esteem, motivation, and achievement. The relationship between perceived control and educational outcomes appears to be gaining considerable empirical and theoretical support (e.g., Covington & Omelich, 1981; Frieze, 1980; Stipek & Weisz, 1981).

Dweck and her colleagues (Diener & Dweck, 1978; Dweck, Goetz & Strauss, 1980; Dweck & Licht, 1980; Dweck & Reppucci, 1973) have approached the issue of controllability in the classroom from a learned helplessness perspective. According to Seligman (1975), helplessness occurs when an organism learns that escape from aversive stimulation and/or the occurrence of reinforcement are independent of its behavior, a relationship referred to as response/outcome noncontingency. Expectancies are learned that its responses will not affect these outcomes which, in turn, interfere with learning new response/outcome relationships. Dweck argues that children who attribute past failures to uncontrollable factors, such as lack of ability, or luck, will eventually give up in the presence of failure (helpless students), while children who attribute past failures to controllable factors, like effort, will persist in the presence of failure (mastery students).

Response/outcome relationships may be useful constructs for understanding control in a variety of classroom settings. Certain student behaviors are necessary to achieve success in a course, such as class attendance, studying, verbal fluency, asking questions, persistence at an assignment, etc. Absence of these behaviors often leads to failure. Contingent relationships would be those in which a given student behavior produces a specified outcome: taking notes and studying course materials result in success, while not taking notes and lack of studying lead to failure. For both success and failure, the response/outcome relationships are contingent. Response/outcome noncontingent relationships would be those in which a student's behavior has little reliable effect on the ensuing outcomes. Class attendance, note-taking, studying, etc., may not produce success consistently and their absence may not lead to failure consistently. Here the presence or absence of these responses are independent of success and/or failure.

Students who perceive that they have control over classroom outcomes may develop greater responsibility for their academic performance. They may be more motivated, involved, and assertive due to expectations that they have some influence over classroom outcomes. They may be more likely to exhibit responses designed to facilitate achievement such as note- taking, studying, questioning, or enrolling in a study methods course or changing instructors. However, students who perceive that they have little control over classroom outcomes may be less likely to exhibit behaviors that facilitate achievement. Thus, they may be more prone to boredom, apathy, failure, absenteeism, and drop-out.

Despite the significance that contingency training appears to have for perceived control in educational settings, little research has been done (Garber & Seligman, 1980). Previous studies have primarily involved laboratory settings, artificial experimental tasks, and dependent measures having little resemblance to academic variables in the classroom. The present experiment examined contingency training effects on student achievement and attributions at the college level under more typical classroom conditions. Specifically, these conditions involved: a contingency manipulation resembling an aptitude test; an instructor presenting a lecture; two levels of student incentive, and an achievement test based on the lecture material.

Student Contingency Training and Teaching Behaviors

Under normal classroom conditions the teacher usually makes a major contribution to the learning process along with the student. Consequently, students having different contingency experiences interact with instuctors exhibiting various teaching behaviors. It seems likely that contingent and noncontingent students may respond differently to the teaching behaviors. For example, noncontingent students may feel more out of control with a disorganized instructor, while contingent students may work harder to organize their notes, or may switch to another instructor. Moreover, an organized instructor may foster feelings of control in noncontingent students leading them to outperform their noncontingent counterparts who have the disorganized instructor.

These interactions can be represented in their simplest form with a two by two factorial design involving student contingency training (contingent, noncontingent) and a specified teaching behavior, e.g., instructor organization (organized, disorganized). Various student outcome measures can be used to assess their effects such as student achievement, student ratings of instruction, attributions, etc. Thus, contingent-and noncontingent-trained students can be compared in different teaching conditions for a variety of student outcome measures. For a disorganized instructor, a noncontingent student may learn less than a contingent student. Or, a noncontingent student may feel more motivated by a high expressive instructor than by a low expressive instructor, while a contingent student is unaffected by differences in instructor expressivenes.

Researchers have not investigated contingency training by teaching behaviors interactions directly, however, some work has been done on person attributes contributing to learned helplessness. For example, Dweck and Bush (1976) studied the interaction of sex of subject and status of experimenter under failure feedback conditions only. They interpreted their results as sex differences in learned helplessness in which failure attributions to uncontrollable outcomes affect performance, depending on the characteristics of the task administrator. Brown and Inouye (1978) investigated competence similarity and the vicarious acquisition of learned helplessness. Model characteristics, i.e., observer-model similarily, affected the vicarious acquisition of behaviors considered to represent helplessness.

Experimenter sex and status, and model similarity can be considered as part of a general category, person characteristics, which may mediate contingency training effects in social situations. The results provide tentative support for a contingency training by person characteristics interaction, but no direct empirical evidence regarding teaching behaviors. Since teaching behaviors may be conceptualized as a subcategory of person characteristics, contingency training by teaching behaviors interactions can be derived for the classroom setting from the more general contingency training by person characteristics interaction. The significance of these interactions is that they can address a number of important research questions: To what extent do teaching behaviors interact with student contingency history to affect achievement, apathy, dropout, etc? Do some teaching behaviors increase the deleterious effects of noncontingency training? Do others remediate noncontingency history deficits?

Student Achievement and Student Attributions

The present experiment examined a student contingency training by teaching behavior interaction in terms of student achievement and student attributions. Instructor expressiveness was selected as the teaching behavior based on previous experimental research indicating that high expressive instructors produce better student achievement and more favorable student ratings than low expressive instructors (e.g., Perry, Abrami, & Leventhal, 1979; Williams & Ware, 1976). A videotape lecture format was used to manipulate instructor expressiveness by varying humor, vocal inflection, physical movement and enthusiasm; and lecture content by varying the number of teaching points covered in a lecture. The basic experimental procedure involved presenting a half-hour videotape to subjects after which they rated the instructor's teaching effectiveness and wrote a multiple-choice test on the lecture material.

Perry and associates (Abrami, Dickens, Perry, & Leventhal, 1980; Abrami, Leventhal, & Perry, 1982; Perry, Abrami, & Leventhal, 1979; Perry, Abrami, Leventhal, & Check, 1979). have extended the instructor expressiveness by lecture content research paradigm to include other classroom variables. In addition to these teaching behaviors, they have investigated student study opportunities, student incentive, instructor reputation, instructor grading practices and instructor-student personality differences. A consistent finding throughout this research is that instructor expressiveness and instructor lecture content affect student ratings and achievement. High expressive or high content instuctors generally produce more favorable ratings and better achievement than low expressive or low content instructors. These effects are modified to some extent by the other variables under consideration.

Instructor expressiveness was combined with contingency training to determine its effects under four different contingency training conditions: contingent, noncontingent, no feedback, and no training. The achievement-enhancing effect of the high expressive instructor was predicted for the no training group since it received no contingency exposure and is comparable to lecture conditions used in the previous research. However, achievement may be impaired in the noncontingent group if their perceived lack of control generalizes to the classroom lecture setting. Perceived uncontrollability may interfere with learning and reduce the effectiveness of the high expressive instructor. Contingent students should perform better for a high expressive instructor since perceived uncontrollability is absent. Predictions were not made for the no feedback students since previous research has not included this manipulation as a contingency condition in a classroom setting.

A second objective was to examine students' causal attributions. Although education seduction researchers have studied the effect of instructor expressiveness on student achievement, they have not considered it's impact on student attribution processes. Following Weiner (1979) and Frieze (1980), causal attributions were examined because they may help to clarify achievement outcomes in the different contingency groups. For example, a high expressive instructor may produce more achievement than a low expressive instructor partly because students develop an increased sense of control in the classroom setting. For noncontingent students who develop perceptions of uncontrollability this effect would be particularly important since the high expressive instructor would foster perceptions of control.

The selection of attribution items was based on Weiner's achievement-motivation model (1979) with its three dimensions: internality (internal, external), stability (stable, unstable), and controllability (controllable, uncontrollable). Specific causal attributions related to these dimensions can be used to assess how students perceive their performance. For example, ability is an internal, stable, and uncontrollable cause, while effort is an internal, unstable, and controllable cause. Although Weiner (1979) and others (e.g., Frieze, 1980) argue that numerous causal attributions may occur in various classroom settings, four measures appear to be used consistently by attribution and learned helplessness researchers: ability, effort, task difficulty, luck. These four measures were grouped together in the present study to form a profile describing student causal attributions in the four contingency conditions.

A second attribution profile was constructed to measure two other aspects of a student's academic performance: emotional arousal and achievement responsibility. Weiner (1979) suggests that emotional arousal follows achievement feedback and can affect subsequent motivation and behavior. Failure produces feelings of shame, and success, pride, both of which are postulated to influence a student's expectations about subsequent achievement. Two attribution items were used to assess the students' emotional response to their achievement performance: competent/incompetent and confident/helpless. Achievement responsibility was considered in terms of teacher and student contributions to student achievement. Thus, a student's attributions of the teacher's and the student's responsibility for his/her achievement can be assessed independently from the first attribution profile.

Learning incentives are an integral part of the classroom setting, and are generally considered to enhance student achievement. A learning incentive variable (low/high) was included in the present experiment in an attempt to improve the overall representativenss of the simulated college classroom (Perry, Abrami, Leventhal, 1979). The inclusion of the incentive variable permitted the contingency training by instructor expressiveness interaction to be examined for both low and high incentive classroom settings.

Based on the contingency training by instructor expressiveness by incentive factorial design, optimal learning conditions should exist for students in the high expressive/high incentive classroom setting. By comparing the high expressive/high incentive and low expressive/ low incentive conditions, it can be determined whether these classroom variables have comparable benefits for each contingency group. Thus, one or all contingency groups may show increased achievement and perceived control. This effect would be particularly important for noncontingent students whose perceptions of uncontrollability may interfere with achievement.

Method

Subjects

The subjects were 296 male and female volunteer introductory psychology students at the University of Manitoba. Subjects signed up for a session and experimental conditions were randomly assigned to sessions. All students received credit toward a course requirement for research participation.

Materials

Contingency task. A 50-item aptitude test was used to manipulate response/outcome contingency based on research at the University of Manitoba Instructional Research Laboratory (Perry, Abrami, Leventhal, & Dickens, Note 1). It consisted of verbal analogies, sentence-completion, and quantitative questions similar to those found on the Miller's Analogies Test and the Graduate Record Exam. The length of the aptitude test was determind from research by Dickens, Perry, and Turcotte (Note 2) which compared the effect of short (25 items), medium (50 items), and long (75 items) test lengths on student attributions. Results indicated that for all test lengths, noncontingent students viewed themselves as having less mastery and control over their aptitude test performance than contingent and no feedback students. The medium test length was selected because it appeared to represent the optimum amount of subject participation time when combined with other experimental procedures (total=1 3/4 hours).

Multiple-choice answer sheets were designed with four alternatives for each of the 50 items. Each alternative provided feedback indicating whether the student's choice was correct (C) or incorrect (X). The answers became visible when a special yellow ink-marker was used to mark the chosen alternative. The subject selected an alternative, marked it with the special pen, and received immediate feedback as to whether the response was correct or incorrect. Two versions of the answer sheet provided either contingent or nonconingent feedback. The contingent answer sheet contained response alternatives labelled accurately, i.e.,, a corrrect alternative was Labelled C and an incorrect alternative was labelled X. For each item a C could only be obtained by selecting the correct alternative. The noncontingent answer sheet contained 13 items which had all four response alternatives designated as C. The 13 items having four C alternatives were randomly selected from the 50 items. Consequently, for the 13 correct items, selecting any of the four alternatives resulted in a C answer. Similarly, for the 37 incorrect items, selecting any alternative resulted in an X answer.

A standard IBM answer sheet was used for the no feedback condition. Subjects recorded their answers to each of the 50 contingency task items using a regular pencil and received no feedback regarding the accuracy of their choice. This manipulation was an attempt to represent testing conditions which also may be found in some field settings.

Videotapes. Two 25-minute color videotape lectures were used which differed systematically in instructor expressiveness (low, high). A psychology professor made a presentation from actual lecture notes on a topic (sex role stereotypes) that was not discussed in the subjects' courses. Expressiveness was defined in terms of physical movement, voice inflection, eye contact, and humor: decreased or increased frequencies of these behaviors represented the low and high expressiveness conditions. Lecture content was equated across expressiveness conditions by selecting high content videotapes developed in previous research by Perry, Abrami, and Leventhal (1979) and Perry, Abrami, Leventhal, and Check (1979). Lecture content referred to the number of teaching points presented during the videotape presentation, with the low content lecture having one-half the points of the high content lecture.

Dependent measures. The dependent variables consisted of six contingency task measures and nine lecture measures. For the contingency task, two attributions items were used to assess the contingency manipulation. Students were asked to rate how much control they had over their aptitude performance (1=no control, 10=total control), and how successful they were on the aptitude test (1=unsuccessful, 10=successful). An attribution profile was constructed involving four attribution items: ability, effort, test difficulty, and luck. Students rated the extent to which each factor determined their aptitude performance (1=Not at all, 10=Entirely).

The nine lecture measures included an achievement test, and two attribution profiles each consisting of four items related to the post-lecture achievement test. The test involved 30 multiple-choice questions based on the lecture content and was designed to assess both retention and conceptual understanding. The first attribution profile included the same four attributions used for the contingency task: ability, effort, test difficulty, luck. Students rated the extent to which each factor determined their post-lecture achievement test performance (1=Not at all, 10=Entirely). The second attribution profile contained four additional items related to achievement responsibility and emotional response. Two items measured the degree to which the student and the teacher influenced the test performance (1=Not at all, 10=Entirely), and two 10-point bipolar scales measured the student's emotional response to the test (1=competent, 10=incompetent; 1=helpless, 10=confident).

Procedure

The experimental procedures consisted of a two-stage sequence: (1) response/outcome contingency training, and (2) classroom lecture simulation. Before doing the contingency task all subjects were informed that the experiment involved teaching processes, and that they would write an aptitude test and view a videotaped lecture. They were also told that, following the lecture, they would evaluate the lecture and write a test on it.

The subjects (excluding no training subjects) were assigned to one of three contingency training conditions: contingent, noncontingent and no feedback. They were tested in groups of 15-20 and were seated alternately with a seat between each. The contingent and noncontingent subjects were instructed on how to use their ink-markers and the invisible answer sheets. The no feedback subjects received instructions on the use of the IBM answer sheets. Contingent and noncontingent subjects recorded their answers using the specially designed answer sheets and yellow ink-markers. No feedback subjects used a standard IBM sheet and a pencil. All subjects then completed the six contingency task dependent measures.

Student incentive was manipulated using a procedure developed by Perry, Abrami, and Leventhal (1979). High-incentive students were told that a performance of 65% or greater on the achievement test would result in their receiving three additional experimental credits. For some students the additional credits could complete their experimental participation requirement for the year and increase the final grade in their psychology course. This information was repeated three times: at the beginning of the experiment; before the videotape lecture, and before the achievement test. Low-incentive students received no information regarding additional experimental credits. Following debriefing at the end of the experiment, all subjects received five credits regardless of their incentive condition or their performance.

During the lecture phase all subjects watched a videotape presented on an Advent 1000A Videobeam Color Projection Unit which projects a 2.2 meter (seven-foot) diagonal color image. Four no training control groups which did not receive any contingency training were added in this phase to participate in the classroom simulation: low incentive-low expressive; low incentive- high expressive; high incentive-low expressive; high incentive- high expressive. For the two high incentive groups, the manipulation was introduced twice: before the videotape lecture and before the achievement test. All students were provided with writing materials to take notes during the lecture. After the lecture the subjects completed the classroom simulation measures in the following order: student achievement test, the four attribution items, the two responsibility for performance items, and the two emotional arousal items. The subjects were then debriefed and their questions answered.

Results

Contingency Task

Perceived control. The contingency manipulation was designed to influence students' attributions of control over their performance on the task. If the manipulation were effective, student attributions of control should vary due to contingency condition and should be independent of actual task success i.e., reinforcement, which may vary within and between contingency groups. A perceived success attribution measure was included to assess any confound between contingency and reinforcement. If differences in reinforcement between the noncontingent and contingent groups were influencing student attributions, then the contingency manipulation should affect student attributions of success on the task.

The perceived control and success attribution measures were analyzed separately using a contingency (contingent, noncontingent, no feedback) by incentive (low, high) analysis of variance (ANOVA). For perceived control, contingency had a significant effect, $F(2,215)=30.01$, $p<.001$, omega and accounted for a sizeable amount of the variance, $\omega^2 = 0.21$. Compared to noncontingent students, contingent students, $t(213)=10.27$, $p<.001$, and no feedback students, $t(213)=10.01$, $p<.001$, perceived they had greater control over their contingency task performance. Neither the incentive variable, nor the contingency by incentive interaction was significant. For the success attribution measure, no significant effects occurred. See Table 1 for the means and standard deviations.

Insert Table 1 about here

<u>Attribution profile</u>. Multivariate and discriminant function analyses were used to assess the effects of contingency training and incentive on students' attributions of their aptitude performance using four items: ability, effort, test difficulty, luck. A contingency (contingent, noncontingent, no feedback) by incentive (low, high) multivariate analysis of variance (MANOVA) indicated a significant contingency effect,

$F(8,420)=12.80$, $p<.0001$, but no incentive main effect or contingency by incentive interaction. The univariate variance accounted for by each attribution in the contingency effect was: ability, omega $\omega^2 = 0.27$; effort, omega $\omega^2 = 0.23$; test difficulty, omega $\omega^2 = 0.15$; luck, omega $\omega^2 = 0$..

A discriminant function analysis was performed to provide greater clarification of the first attribution profile (Table 2). Although there were two functions, Function 1 accounted for most of the variance (93.47%) compared to Function 2 (6.53%), and consequently the remaining

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Insert Table 2 about here

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discussion will be restricted to Function 1. It suggests an <u>internal locus</u> orientation which is represented by high loadings on the internal attribution factors, student ability and effort, coupled with some emphasis on the difficulty of the contingency task. The group centroids indicate that the contingent and no feedback students have a more internal locus orientation than the noncontingent students. That is, the contingent and no feedback students consider their contingency task performance to be due to their ability and effort to a much greater degree than noncontingent students. Furthermore, the contingent and no feedback students place greater emphasis on the difficulty of the contingency task in accounting for their performance than noncontingent students.

Classroom Lecture

The lecture phase involved a contingency training (contingent, non-contingent, no feedback, no training) by instructor expressiveness (low, high) by student incentive (low, high) factorial design assessing student achievement and student attributions. The attributions were arranged into two separate profiles which consisted of four attribution items referring specifically to the student's performance on the achievement test. The results are described sequentially below for the dependent variables.

Student achievement. The student achievement means and standard deviations for the classroom simulation conditions are presented in Table

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Insert Table 3 about here

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3. A 4 x 2 x 2 ANOVA was used to test the effects of contingency training, instructor expressiveness, and student incentive on student achievement. Main effects occurred for: contingency training, $F(3,290)=6.78$, $p<.001$; instructor expressiveness, $F(1,290)=23.49$, $p<.001$, and student incentive, $F(1,290)=11.30$, $p<.001$, which accounted for 5%, 6% and 3% of the variance respectively. These main effects were qualified by: a contingency training by incentive interaction, $F(3,290)=3.24$, $p<.05$; an incentive by expressiveness interaction, $F(1,290)=4.37$, $p<.05$, and a contingency training by incentive by expressiveness interaction, $F(3,290)=3.97$, $p<.01$, which accounted for 2%, 1% and 2% of the variance respectively. Subsequent analyses were restricted to the third-order interaction, since it qualified the two second-or-

der interactions and was appropriate for testing the instructor expressiveness and optimal learning effects.

Figure 1 describes the contingency by expressiveness by incentive in-

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Insert Figure 1 about here

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teraction for student achievement. The incentive and expressiveness variables are arranged along the x-axis with the expressiveness variable represented for each incentive level. The <u>instructor expressiveness</u> effect was tested by comparing a contingency group's achievement for the low and high expressive instructor in each incentive condition. The <u>optimal learning</u> effect was tested for each contingency group by comparing classroom conditions which represented the least (low expressive/low incentive) and the most (high expressive/high incentive) effective learning conditions. Bonferroni *t*-tests (Kirk, 1968) were computed for 12 comparisons with a critical *t* value=2.64, and with a one-tailed *p* =.05.

For the low incentive classroom conditions, the high expressive instructor, compared to the low expressive instructor, significantly increased student achievement for contingent ($t=4.28$) and no training ($t=2.65$) students, but did not increase achievement for noncontingent ($t=2.04$) and no feedback ($t<1$) students. For the high incentive classroom conditions, the high expressive instructor, compared to the low expressive instructor, increased achievement for the no feedback students ($t=2.67$), but did not increase achievement for the contingent ($t<1$), noncontingent ($t=1.14$), and no training ($t<1$) students. The comparison between the least and most effective classroom learning conditions indicated significant achievement gains for the contingent (t=4.13), noncontingent (t=3.18), and no training (t=3.63) students, but not for the no-feedback students (t<1).

These results show that instructor expressiveness affects student achievement differently depending on contingency training history and classroom incentive conditions. Instructor expressiveness improves achievement for contingent students in the low incentive classroom condition, but does not improve achievement in the high incentive condition. Expressiveness has _no_ effect on noncontingent students in either incentive condition. However, when expressiveness and incentive are combined achievement improves significantly for noncontingent students (high expressiveness/high incentive versus low expressiveness/low incentive). Thus, contingency training shoud be considered when structuring classroom learning conditions to optimize student achievement. Noncontingent students appear to require more enriched conditions to enhance their performance than contingent students.

Attribution profile 1. The means and atandard deviations for attribution profile 1 (ability, effort, teat difficulty, luck) are presented in Table 3. A contingency training (contingent, noncontingent, no feedback, no training) by instructor expressiveness (low, high) by student incentive (low, high) MANOVA indicated significant effects for: instructor expressiveness, $F(4,277)=5.87$, $p<.001$ student incentive, $F(4,277)=3.18$, $p<.01$; expressiveness by incentive, $F(4,277)=2.67$, $p<.03$; and contingency by expressiveness by incentive, $F(12,733.165)=3.02$, $p<.001$. The amount of variance explained for each attribution in the triple interaction was: ability=4%; effort=5%; test difficulty= 0%; luck=1%.

A discriminant function analysis was performed for the contingency by incentive by expressiveness multivariate interaction. The significant function accounted for 70.03% of the variance and is characterized by high, positive loadings on the two internal dimensions, ability and effort, and by a moderate, negative loading on an external dimension i.e., luck (Table 4). Similar to the attribution profile following the contingency task (Table 2), this attribution profile also suggests an <u>internal locus</u> orientation.

Insert Table 4 about here

The higher the contingency group centroids, the greater is the internal locus orientation. The comparison of the contingency groups in terms of internal locus is relative and is based on the actual range of the group centroids and on the differences between them. A meaningful difference between group centroids was defined as one-third of the range, i.e., 1/3(2.95-1.03)=+0.64. Thus, a group centroid of 2.75 would suggest greater internal locus orientation than a group centroid of 2.00.

The contingency group centroids were examined to determine the effect of instructor expressiveness and optimal classroom learning conditions on internal locus orientation. For instructor expressiveness, contingency group centroids were compared between the low and high expressive instructors for each incentive condition. In the low incentive conditions, differences between the low and high expressive instructors for each contingency group were as follows: contingent (+1.55), noncontingent (+1.05), no feedback (-0.18), and no training (+0.78). In the high incentive conditions, contingency group centroid differences were: contingent (-0.66), noncontingent (+0.25), no feedback (+1.05) and no training (+0.09). Using +0.64 as the criterion for meaningful differences these results indicate that instructor expressiveness increased internal locus orientation in low incentive conditions for contingent, noncontingent, and no training students, but did not increase it for no feedback students; while in high incentive conditions it increased internality for no feedback students only. Consequently, instructor expressiveness appears to enhance an internal locus orientation in contingent, noncontingent, and no training students in low incentive conditions, but not in high incentive conditions.

For optimal classroom learning conditions, contingency group centroids were compared between the least and the most effective learning conditions (low expressive/low incentive vs. high expressive/high incentive). Contingency groups differed between classroom conditions as follows: contingent (+1.11), noncontingent (+0.79), no feedback (+0.40) and no training (+1.19). Based on the +0.64 criterion, enhancing classroom learning conditions increased an internal locus orientation for contingent, noncontingent, and no training students, but not for no feedback students.

Attribution profile 2. The means and standard deviations for attribution profile 2 (self, teacher, competence, helpless) are presented in Table 3. A contingency training (contingent, noncontingent, no feedback, no training) by instructor expressiveness (low, high) by student incentive (low, high) MANOVA indicated significant main effects for expressiveness, $F(4,277)=8.34$, $p<.001$, and incentive, $F(4,277)=3.25$, $p<.01$, and for the contingency by expressiveness by incentive interaction, $F(12,733.165)=2.76$, $p<.001$. The amount of variance explained for each attribution measure in the triple interaction was: self, 3%; teacher 0%; competent/incompetent, helpless/confident, 4%.

A discriminant function analysis was performed for the contingency by incentive by expressiveness interaction. The significant function accounted for 72.02% of the variance and is characterized by a high, positive loading on the self attribution and a high, negative loading on the helpless attribution, and a moderate, positive loading on the competence attribution (see Table 4). Whereas attribution profile 1 describes internal locus orientation, this profile suggests a self-confidence orientation in which the self, confidence, and competence attributions form the significant elements. As with attribution profile 1, the interpretation of meaningful differences between group centroids was based on one-third of the actual range, i.e., 1/3(3.96-2.59)=+0.46.

The contingency group centroids were compared to determine the effect of instructor expressiveness and optimal classroom learning conditions on student self-confidence. For instructor expressiveness, contingency group centroids were compared between low and high expressive instructors for each incentive condition. In the low incentive conditions, contingency group centroid differences between the low and high expressive instructors were: contingent (+1.24), noncontingent (+0.45), no feedback (-0.42) and no training (+0.86). In the high incentive conditions, contingency group centroid differences were: contingent (-0.44), noncontingent (+0.44), no feedback (+0.85), no training (-0.10). Using +0.46 as the criterion for meaningful differences, these results indicate that instructor expressiveness increases self-confidence in low incentive conditions for contingent and no training students, but not for noncontingent and no feedback students, and in high incentive conditions for no feedback students only. Thus, instructor expressiveness appears to increase self-confidence for contingent students in low incentive, but not in high incentive conditions. It has no effect on self-confidence for noncontingent students in either incentive condition.

For optimal classroom learning, contingency group centroids were compared between the least and the most effective learning conditions (low expressive/low incentive vs. high expressive/high incentive). Contingency group differences between classroom conditions were as follows: contingent (+0.93), noncontingent (+1.27), no feedback (+0.14), no training (+0.68). These results show that enhancing classroom learning conditions increases self-confidence for all contingency training groups except the no feedback group.

Discussion

Perceived control appears to have important implications for the educational system, although previous research has not been extensive (e.g., Stipek & Weisz, 1981). The present experiment investigated perceived control in a simulated college classroom using response/outcome contingency training. The results show that perceived control can be manipulated effectively using contingency training and that the method (aptitude test) is representative of classrooms in the field. They also indicate that contingency training interacts with other classroom variables to affect a students' educational development. These results have some consistency with learned helplessness theory, and broaden Dweck's research with school children to college students and to other classroom issues.

Contingency Task

The contingency task used here was intended to meet two general criteria: classroom representativeness and manipulation effectiveness. Although previous research has shown some tasks to be effective, their generalizability to educational settings is weak. For example, some studies have used escape-avoidance tasks which require an instrumental button-pressing response to terminate the aversive stimulation. (e.g. Sherrod & Downs, 1974). Others have substituted positive reinforcement for aversive stimulation following Seligman's argument (1975) that learned helplessness results from any noncontingent outcome (e.g., Benson & Kennelly, 1976). Intelligence tests (Thornton & Jacobs, 1971), block-designs (Dweck & Repucci, 1973), digit-letter substitution (Dweck & Bush, 1976), and Levine discrimination problems (Willis & Blaney, 1978) have also been used as contingency tasks.

Classroom representativeness was enhanced by developing a multiple-choice, group-administered ability test that resembles some cognitive tests used in classroom settings. It departs from many contingency tasks which are individually-administered and which have little similarity to achievement tests in actual classrooms. Moreover, the contingency manipulation met several criteria described by Roth (1980) as necessary for an effective contingency task: (a) it should be a cognitive task (e.g., intelligence test) rather than a simple psychomotor task (e.g., shuttle-box, finger-maze); (b) it should involve reinforcement or avoidance of aversive stimulation as an outcome; (c) it should be important to the subject; (d) it should have numerous alternatives represented by additional problems and/or trials; (e) it should create psychological threat or loss of control, and (f) it should result in failure attributions being made to ability.

Manipulation effectiveness was assessed using the perceived control and success measures and the attribution profile. The contingency manipulation produced a very large effect omega (ω^2 =0.21) on students' attributions of control without affecting their attributions of success. Consequently, the noncontingent students felt less control than contingent and no feedback students, but it was not due to perceived lack of success since all groups felt equally successful. Some researchers (e.g., Miller & Norman, 1979) have argued that discrimination tasks employing random reinforcement as a noncontingent outcome may confound the amount and pattern of reinforcement with the contingency manipulation when the noncontingent group is not yoked to the contingent group. Since little research has been done on this issue, and since existing data are somewhat contradictory (e.g., Benson & Kennelly, 1976), it would be premature to generalize these results to other contingency tasks such as the one used in this study. More importantly, the perceived success results indicate that contingent and noncontingent students judged themselves to be equally successful on the contingency task. It seems unwarranted, therefore, to conclude that the contingency manipulation is confounded with amount of reinforcement in the present experiment since the perceived success results suggest otherwise, and since past contingency manipulations have been extremely variable and the results inconsistent.

The attribution profile describes an internal locus orientation in which ability and effort are the most important dimensions followed by test difficulty. The group centroids indicated that the contingent and no feedback students showed greater internal locus than the noncontingent students. That is, the contingent and no feedback students perceived their ability, their effort, and to some extent, test difficulty, as contributing more to their contingency task performance than did the noncontingent students. Consequently, the attribution profile for noncontingent students shows that they perceive their ability and their effort and, to some extent test difficulty, contribute significantly less to their performance. Combined with the perceived success measure, these results show that although noncontingent students do not perceive themselves as any less successful on the contingency task than contingent and no feedback students, they do show much less internal locus orientation for their performance.

Thus, the group-administered aptitude test format is more representative for classroom settings, and appears to be an effective method for manipulating contingency relationships. A brief exposure to contingency training using an aptitude test had immediate effects on students' perceived control and causal attributions. These effects were sufficiently strong to influence subsequent performance in the simulated college classroom as evident from the post-lecture results.

Contingency Training and Teaching Behaviors

The contingency training by instructor expressiveness interaction was investigated in combination with student incentive in a simulated college classroom. Post-lecture results indicated that a significant third-order interaction occurred for student achievement and both student attribution profiles 1 and 2. The consistency of the interaction effects across all three dependent variables, and the general pattern of results for each dependent variable, provide empirical evidence supporting an interaction approach to contingency training in the classroom.

The contingency training by instructor expressiveness interaction varied within each level of student incentive. In low incentive conditions a high expressive compared to a low expressive instructor enhanced student achievement, internal locus, and self-confidence orientations for contingent and no training students, but not for no feedback students. For noncontingent students, high expressiveness increased only their internal locus orientation but did not increase their achievement or self-confidence. In the high incentive conditions, the high expressive instructor increased student achievement, internal locus, and self-confidence for only no feedback students.

These results suggest that exposure to noncontingent outcomes can impair some aspects of a student's academic development. Students receiving noncontingency training felt less control, and made less internal attributions to their performance on the aptitude test (Table 1). This orientation appears to have interfered with their ability to benefit from the high expressive instructor during the classroom simulation. Although they developed a more internal locus with the high expressive instructor, the noncontingent students did not show the increased achievement and self-confidence that their contingent and no training counterparts showed.

Further clarification is provided by the optimal learning conditions results. In the most effective learning conditions (high expressive/high incentive) contingent, noncontingent, and no training students increased achievement, internal locus, and self- confidence orientations. The noncontingent students' results are particularly interesting since they qualify the instructor expressiveness findings. Although noncontingent students showed no improvement in achievement and self-confidence between low and high expressiveness in either incentive condition, improvements did occur when expressiveness and incentive were introduced into the classroom together (high expressive/high incentive versus low expressive/low incentive).

Taken together, these results suggest that exposure to noncontingent outcomes impairs student achievement and self-confidence, but that these effects can be remediated. When the quality of teaching is improved with a high expressive instructor, noncontingent students showed few of the improvements that were demonstrated by contingent and no training students. Although noncontingent students developed a more internal locus orientation, they did not show increased achievement or self- confidence. Only when high expressiveness was combined with high incentive did noncontingent students improve their achievement and self- confidence. Thus, modifying the effects of noncontingent training is a complex issue involving more than instructor expressiveness. These results are encouraging, however, in that they suggest that improvements can be made.

The results can be considered in relation to learned helplessness research. Consistent with helplessness theory (e.g., Abramson, Seligman, & Teasdale, 1978), exposure to noncontingent outcomes produced perceptions of uncontrollability and attributions of reduced internal locus. Noncontingent students judged themselves as having less ability, and making less effort than their contingent counterparts. External attributions were much less important in explaining aptitude and achievement outcomes (see Tables 2 & 4 respectively). The emphasis on internal attributions is not unexpected considering the highly selective nature of the educational system. College students are the end-product of a selection system which retains primarily those whose success is dependent on their ability and effort. Repeated experience with the system and continuous feedback from teachers, peers, and parents teaches students to interpret achievement outcomes in terms of these factors. Even at the secondary school level, external attributions about achievement (e.g., luck) are infrequent (Frieze, 1980). Consequently, given the educational context of the experiment, contingency training effects should be most evident for the internal attributions.

The results may also be compared to Dweck's research. Dweck contends that under failure conditions, attributions to lack of effort produces a mastery orientation, while lack of ability produces a helplessness orientation. In the present experiment, noncontingent-trained students attributed their aptitude test performance to a lack of both ability and effort, and consequently their results do not conform exactly with Dweck's position. However, if effort is considered as a stable rather than an unstable factor, and there is some suggestion that this may occur for some subjects, and/or if greater weighting is given to the ability factor, then the noncontingent students' results may be more consistent with Dweck's position. That is, the lack of improvement in achievement or self-concept following better quality instruction suggests that the noncontingent students may feel helpless.

It is also worth considering the incentive results in relation to learned helplessness. According to Seligman (1975) and others (e.g., Miller & Norman, 1979), noncontingency training produces motivational, cognitive, and emotional deficits which interfere with subsequent learning and performance. The noncontingent students in the present experiment showed impaired achievement performance under teaching conditions designed to enhance learning (high expressiveness). Only when high incentive was introduced along with high expressiveness did achievement improve. From a learned helplessness perspective, the motivational deficit produced by noncontingent outcomes may interefere with learning in the high expressive condition. Increasing student incentive may reduce the motivational deficit, thus allowing the achievement- enhancing effects of high expressiveness to occur.

The linking between the present results on perceived control and learned helplessness is interesting, but should be regarded as speculative at this point. Further research is needed to consider the merits of studying perceived control in the college classroom from a learned helplessness perspective.

Other Issues

Further consideration of the no feedback results is in order. The manipulation was included in the present experiment because in some classroom settings students do not get feedback after completing an achievement task. For example, students in university courses sometimes do not receive feedback about their exam performance until weeks later. For the low and high incentive conditions, instructor expressiveness produced opposite effects on no feedback students compared to the other groups. That is, expressiveness had no effect in low incentive, but in high incentive, expressiveness increased student achievement, internal locus, and self- confidence. Opposite effects were also found for the optimal learning hypothesis in that the no feedback students showed no improvement on any of the dependent variables. It is unclear why the no feedback group performed so differently from the other contingency groups, however, the consistency of their results underscores the need for further research.

These results also suggest some modification to the instructor expressiveness research (Abrami, Leventhal, & Perry, 1982). First, the present results extend the expressiveness effects from student ratings and student achievement, to include student causal attributions as well. For contingent and no training students, the high expressive instructor increased achievement, internal locus and self-confidence. Second, the expressiveness effect was weak in the low incentive condition for noncontingent students who increased only their internal locus orientation, and was absent for no feedback students who demonstrated no change on any dependent measure. These results suggest that the expressiveness effect requires some qualification depending on student characteristics. Finally, the effect was qualified by incentive conditions. No facilitation effect was found for the contingent, noncontingent, and no training groups in the high incentive classroom. However, an examination of the achievement results in Figure 1 suggests that, although expressiveness did not affect the performance of these groups in the high incentive conditions, they nevertheless attained high achievement levels. This would suggest that increased incentive may produce a ceiling effect which serves to mask the facilitating effect of the expressiveness variable. Thus, instructor expressiveness appears to influence only certain students, namely contingent and no training, and ~~under~~ low incentive conditions.

Finally, some caution should be exercised when interpreting the present results. First videotape research has several potential weaknesses which may limit the generalizability of results from the laboratory to the field setting (Abrami et al., 1982; Perry et al., 1979). However, generalizability may be acceptable for courses using videotape instruction such as distance-education or multi-section classes; and for courses having brief instructor contacts such as multi-instructor formats and teacher in-services. Second, contingency training was short and is not representative of longer exposures, or repeated exposure over years. Consequently, the present results may be a conservative estimate of contingency training effects having greater durations. Third, the subject population consisted of college students who may be more resistant to noncontingent outcomes than elementary or secondary school students due to the highly-selective nature of the educational system. Fourth, other teaching behaviors than expressiveness may not interact with contingency training. Further research is needed to identify relevant teaching behaviors, and to determine whether they have comparable effects.

REFERENCE NOTES

1. Perry, R.P., Abrami, P.C., Leventhal, L., & Dickens, W.J. Learned helplessness in the classroom: Are teacher characteristics involved? American Psychological Association, Toronto, 1978.

2. Dickens, W.J., Perry, R.P., & Turcotte, S. Effects of learned helplessness in a university classroom. American Psychological Association, Los Angeles, 1981.

REFERENCES

Abrami, P.C., Dickens, W.J., Perry, R.P., & Leventhal, L. Do teacher standards for assigning grades affect student evaluations of teaching. Journal of Educational Psychology, 1980, 72, 107-118.

Abrami, P.C., Leventhal, L., & Perry, R.P. Educational seduction. Review of Educational Research, 1982, 52, 446-464.

Benson, J.S., & Kennelly, K.J. Learned helplessness: The report of uncontrollable reinforcements or uncontrollable aversive stimuli. Journal of Personality and Social Psychology, 1976, 31, 311-327.

Brown, I., & Inouye, D.K. Learned helplessness through modeling: The role of perceived similarity in competence. Journal of Personality and Social Psychology, 1978, 12, 147-908.

Covington, M.W., & Omelich, C.L. As failures mount: Affective and cognitive consequences of ability demotion in the classroom. Journal of Educational Psychology, 1981, 73, 796-808.

Diener, C.I., & Dweck, C.S. An analysis of learned helplessness: Continuous changes in performance strategy, and achievement cognitions following failure. Journal of Personality and Social Psychology, 1978, 36, 451-462.

Dweck, C.S., & Bush, E.S. Sex differences in learned helplessness: I. Differential debilitation with peer and adult evaluators. Developmental Psychology, 1976, 12, 147-156.

Dweck, C.S., & Goetz, T.E. & Strauss, N. Sex differences in learned helplessness: IV. An experimental and naturalistic study of failure generalization and its mediators. Journal of Personality and Social Psychology, 1980, 38, 441-452.

Dweck, C.S., & Licht, B.G. Learned helplessness and intellectual achievement. In J. Garber & M.E.P. Seligman (Eds.), Human helplessness: Theory and applications. New York: Academic Press, 1980.

Dweck, C.S., & Repucci, N.D. Learned helplessness and reinforcement responsibility in children. Journal of Personality and Social Psychology, 1973, 25, 109-116.

Frieze, I. Beliefs about success and failure in the classroom. In J.H. McMillan (Ed.), The social psychology of school learning. New York: Academic Press, 1980.

Garber, J., & Seligman, M.E.P. (Eds.) Human helplessness: Theory and applications. New York: Academic Press, 1980.

Miller, I.W., & Norman, W.H. Learned helplessness in humans: A review and attribution theory model. Psychological Bulletin, 1979, 86, 93-118.

Perry, R.P., Abrami, P.C., & Leventhal, L. Educational seduction: The effect of instructor expressiveness and lecture content on student ratings and achievement. Journal of Educational Psychology, 1979, 71, 107-116.

Perry, R.P., Abrami, P.C., Leventhal, L., & Check, J. Instructor reputation: An expectancy relationship involving student ratings and achievement. Journal of Educational Psychology, 1979, 71, 776-787.

Roth, S. A revised model of learned helplessness in humans. Journal of Personality, 1980, 48, 103-133.

Seligman, M.E.P. Helplessness: On depression, development and death. San Francisco: W.H. Freeman, 1975.

Sherrod, D.R., & Downs, R. Environmental determinants of altruism. Journal of Experimental Social Psychology, 1974, 10, 468-479.

Stipek, D.J., & Weisz, J.R. Perceived personal control and academic achievement. Review of Educational Research, 1981, 51, 101-137.

Thornton, J.W., & Jacobs, P.D. Learned helplessness in human subjects. Journal of Experimental Psychology, 1971, 87, 369-372.

Weiner, B. A theory of motivation for some classroom experiences. Journal of Educational Psychology, 1979, 71, 3-25.

Williams, R.G., & Ware, J.E. Validity of student ratings of instruction under different incentive conditions: A further study of the Dr. Fox effect. Journal of Educational Psychology, 1976, 68, 48-56.

Willis, M.H., & Blaney, P.H. Three tests of the learned helplessness model of depression. Journal of Abnormal Psychology, 1978, 87, 131-136.

FOOTNOTES

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Table 1: Means and standard deviations for contingency task attributions

	Contingent		Noncontingent		No Feedback	
	Low Incentive	High Incentive	Low Incentive	High Incentive	Low Incentive	High Incentive
Control[a]						
M	6.21	6.19	2.81	2.06	6.43	5.81
SD	2.11	2.38	2.10	1.87	2.05	2.33
Success[b]						
M	4.97	5.68	4.75	3.97	5.10	4.86
SD	2.40	2.44	3.34	3.48	2.26	2.23
Ability[c]						
M	5.88	5.94	3.06	2.59	6.30	5.86
SD	2.17	2.65	2.11	2.19	2.30	2.42
Effort[c]						
M	5.91	6.30	3.97	2.94	6.95	6.25
SD	2.16	2.46	2.61	2.37	2.53	2.31
Difficulty[c]						
M	5.97	6.96	4.94	4.97	7.55	7.69
SD	2.12	2.26	3.14	3.59	1.75	1.77
Luck[c]						
M	4.03	3.60	4.59	3.06	3.88	4.56
SD	2.34	2.42	3.29	2.74	2.40	1.98
n	32	47	32	32	40	36

[a]How much control did you have over your performance on the aptitude test?
1 = No control 10 = Total control

[b]How successful were you on the aptitude test?
1 = Unsuccessful 10 = Successful

[c]How much did ______________ contribute to your performance on the aptitude test?
1 = Not atall a factor 10 = Entirely a factor

Table 2

Attribution profile 1: Discriminant function analysis for contingency training main effect on student attributions following the contingency task (Function 1).

Discriminant Analysis

Causal Attributions	z weights	structure correlations
Ability	.609	.871
Effort	.408	.813
Test Difficulty	.221	.659
Luck	.175	.252

Contingency Groups	Group Centroids
Contingent	3.40
Noncontingent	2.11
No Feedback	3.67

Table 3: Means and standard deviations for the nine classroom simulation dependent variables

	Low Incentive							
	Low Expressiveness				High Expressiveness			
	C	NC	NF	NT	C	NC	NF	NT
Achievement[a]								
M	15.06	15.80	21.11	18.44	21.47	18.94	21.81	21.60
SD	3.94	5.88	3.40	5.56	2.70	4.83	3.74	3.47
n	16	15	19	23	17	17	21	30
Ability[b]								
M	3.93	4.83	6.50	5.17	6.53	7.88	6.00	5.59
SD	2.22	2.89	2.94	2.23	1.97	1.79	2.27	1.78
Effort[b]								
M	4.87	6.50	6.61	4.87	7.12	7.31	5.90	6.59
SD	2.83	2.65	2.52	2.38	1.83	1.85	1.97	1.88
Difficulty[b]								
M	5.07	5.33	6.39	5.30	6.06	5.44	6.20	6.45
SD	2.69	1.97	2.55	2.23	2.33	2.28	2.17	1.82
Luck[b]								
M	5.47	4.33	3.28	4.78	2.53	3.13	2.60	2.90
SD	3.16	3.29	2.22	2.61	2.00	2.42	1.23	1.66
Self[b]								
M	4.93	4.83	6.83	6.04	5.94	4.94	5.30	6.14
SD	2.28	2.69	2.57	1.82	2.16	2.46	2.13	1.46
Teacher[b]								
M	3.87	4.42	5.06	4.57	6.82	5.25	5.90	6.41
SD	3.20	2.84	3.02	2.23	1.38	2.52	2.67	1.76
Competent/Incompetent[c]								
M	5.13	4.83	3.94	4.39	4.12	3.50	3.15	3.62
SD	3.18	2.41	2.98	2.68	2.74	2.16	1.90	2.48
Helpless/Confident[c]								
M	5.67	5.50	6.83	5.26	8.00	6.63	6.15	7.93
SD	3.50	3.21	2.75	2,54	1.66	2.92	2.52	1.53
n	15	12	18	23	17	16	20	29

Table 3: (continued): Means and standard deviations for the nine classroom simulation dependent variables

	High Incentive							
	Low Expressiveness				High Expressiveness			
	C	NC	NF	NT	C	NC	NF	NT
Achievement[a]								
M	20.78	18.94	18.61	22.88	20.79	20.65	22.44	23.09
SD	5.57	4.48	4.27	3.76	4.67	3.16	4.48	3.13
n	23	16	18	17	24	17	18	22
Ability[b]								
M	7.48	6.72	5.28	6.77	6.18	7.44	6.53	6.70
SD	2.23	1.91	2.27	1.99	2.06	1.90	2.40	1.53
Effort[b]								
M	7.52	7.07	5.83	6.59	6.59	7.19	7.77	6.90
SD	1.83	2.38	2.26	1.70	2.34	1.94	1.60	1.83
Difficulty[b]								
M	6.57	5.33	6.50	5.71	6.46	6.00	6.12	6.20
SD	2.04	2.26	2.38	1.83	2.22	2.19	2.12	2.19
Luck[b]								
M	2.95	4.27	4.11	3.29	3.50	3.13	3.53	2.80
SD	2.31	2.31	2.27	1.83	2.30	1.63	2.10	1.61
Self[b]								
M	7.67	6.60	5.61	6.47	5.82	6.63	6.29	6.50
SD	2.06	2.20	2.20	1.63	2.17	1.93	1.40	1.64
Teacher[b]								
M	4.81	4.60	5.50	4.94	5.46	6.13	5.88	5.95
SD	2.32	2.50	2.07	1.71	2.28	2.09	2.03	1.19
Incompetence[c]								
M	3.29	4.07	5.44	3.00	4.59	3.56	3.35	3.55
SD	2.17	2.15	2.50	1.46	2.56	2.31	1.77	2.09
Helplessness[c]								
M	7.14	6.33	5.78	7.53	7.18	7.38	7.59	7.20
SD	1.40	2.44	2.49	1.28	2.04	2.47	1.42	1.67
n	15	12	18	23	17	16	20	29

C = Contingent
NC = Noncontingent
NF = No Feedback
NT = No Training

Table 3: (continued): Means and standard deviations for the nine classroom simulation dependent variables

[a]Differences between achievement ns and attribution ns are due to some subjects not completing their attribution questionnaires.

[b]How much did ______________ contribute to your performance on the achievement test?

1 = not at all 10 = Entirely

[c]How did you feel about your performance on the achievement test?

1 = Competent 10 = Incompetent

1 = Helpless 10 = Confident

Table 4: Discriminant function analyses of the contingency training by student incentive by instructor expressiveness interaction for student attributions following the lecture.

A. Discriminant Analysis

Attribution Profile 1	z weights	structure correlations
1. ability	.512	.78
2. effort	.665	.79
3. test difficulty	-.297	.12
4. luck	-.341	-.46
Attribution Profile 2		
1. self	.638	.74
2. teacher	.257	.32
3. competent/incompetent	.251	.50
4. helpless/confident	.460	-.77

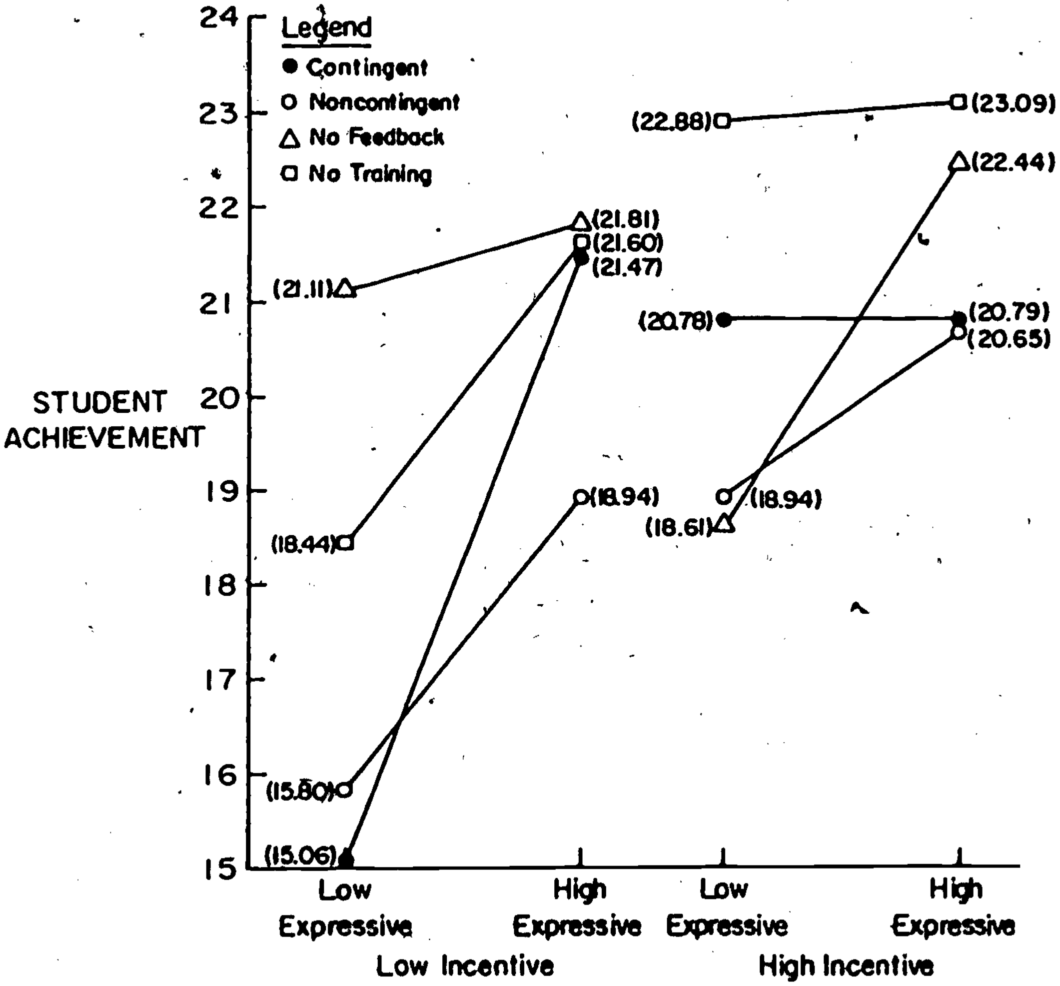
Table 4 (continued): Discriminant function analyses of the contingency training by student incentive by instructor expressivensss interaction for student attributions following the lecture.

B. Group Centroids

	Low Incentive		High Incentive	
	Low Expressive	High Expressive	Low Expressive	High Expressive
Profile 1				
Contingent	1.03	2.58	2.80	2.14
Noncontingent	1.90	2.95	2.44	2.69
No Feedback	2.22	2.04	1.57	2.62
No Training	1.30	2.08	2.40	2.49
Profile 2				
Contingent	2.59	3.83	3.96	3.52
Noncontingent	2.62	3.07	3.45	3.89
No Feedback	3.69	3.27	2.98	3.83
No Training	3.02	3.88	3.80	3.70

FIGURE CAPTIONS

FIGURE 1: Student achievement means for the contingency by expressiveness by incentive interaction.



Ach
LI - C, NT
HI · NF

Self-conf.
LI C, NT
HI NF

Internal
LI C, NC, NT
HI NF